

The amount of water circulated is usually from 10 to 20 times the amount of steam condensed, to ensure that the pipe surfaces should be kept wet from top to bottom of the condenser, and the condensation is usually from 10 to 11 lb. of steam per square foot per hour.

Comparative Merits of Jet and Surface Condensers.—The

initial cost of a jet condenser is less than that of a surface condenser of the same condensing capacity, and if plenty of suitable and cheap feed water is available the jet condenser is commonly adopted, though, generally speaking, more power is required for the operation of the pumps. Sometimes the deciding factor is whether the condensing water contains salts which would form a scale on the condenser tubes, or is of a nature which would be liable to cause corrosion and pitting of these tubes, in which cases the jet condenser would have a decided advantage. But where it is desired to collect the water of condensation for boiler feed, the surface condenser would be required for this purpose. There is also the advantage in this case that the consumption of steam by the engines or turbines is readily ascertained if care is taken to keep the condenser tubes tight against leakage of circulating water.

Thus, as to whether jet condensers or surface condensers should be installed depends upon the circumstances of each case, and generally can only be decided after competitive estimates of initial cost and working costs have been made.

CHAPTER II

Air-pumps

The duty of the air-pump is to remove air from the condenser as fast as the air enters. If the same air-pump is also used to extract the water it is said to be a "wet" air-pump, but if it deals only with the air and the vapour it is termed a "dry" air-pump.

The wet air-pump is usually adopted in condensers connected to reciprocating engines, but in condensers for high vacua with steam turbines dry air-pumps deal with the air and associated vapour, and a

separate pump
is used for extracting the water. By the latter arrangement
the water can
be extracted at the highest possible temperature when
required for boiler
feed, while the air may be further cooled and " devaporized
" either by
specially arranged tubes in the surface condenser or by the
injection of cold
water into the air on its way to the dry air-pump. This
results in a con-
siderable reduction of the volume of the air, as is shown by
the following
calculations. As mentioned on p. 214, according to Dalton's
law of mixtures,
the total pressure in the condenser is the sum of the
partial pressures of
the air and the vapour. If, for example, the temperature at
the air-pump
suction is 86° F., and the total pressure 1-508 in. of
mercury, reference to